

# *Who Moved My TV?? A Tour de Farce on Digital Convergence*



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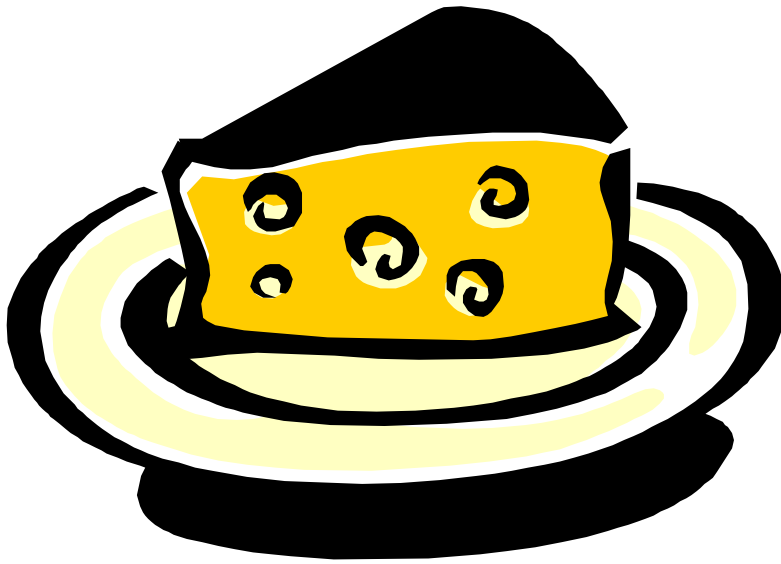
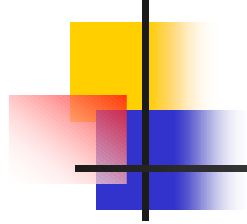
Victor McCrary, Chief  
Convergent Information Systems

February 8, 2001

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# The Old Cheese: Technology Silos



- Analog media remnants
- Proprietary standards
- Lack of interoperability
- Evolutionary solutions

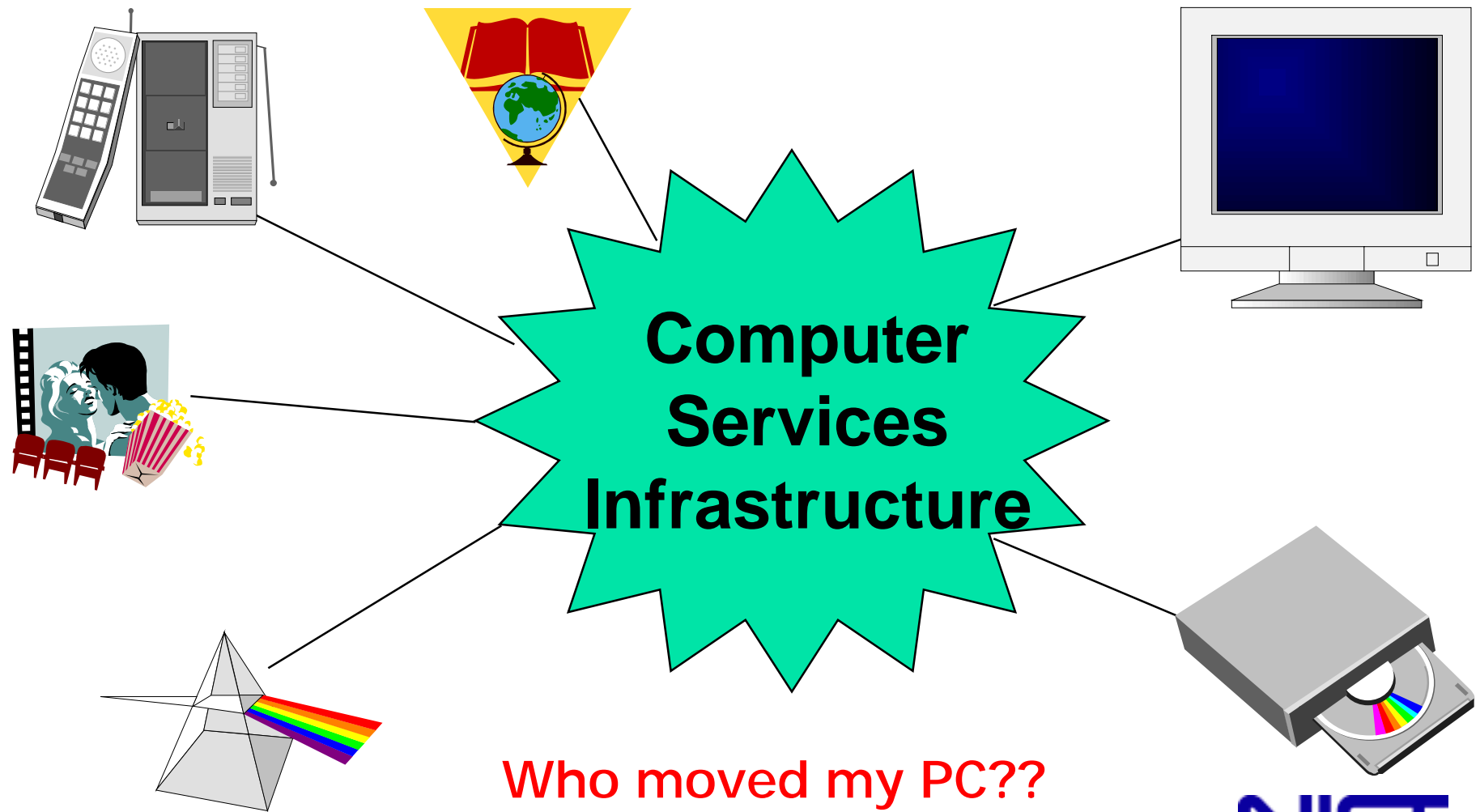
Why moved my cheese?

# The New Cheese: Digital Convergence

- It's all 1s & 0s for all media types
- Open standards
- Interoperability leading to broad-based acceptance
- Revolutionary solutions; e.g. digital cinema



# *Technology & Standards Development at the Network/User Interface*



**NIST**

# Convergence

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MOBILITY



COMPLEXITY/PRICE

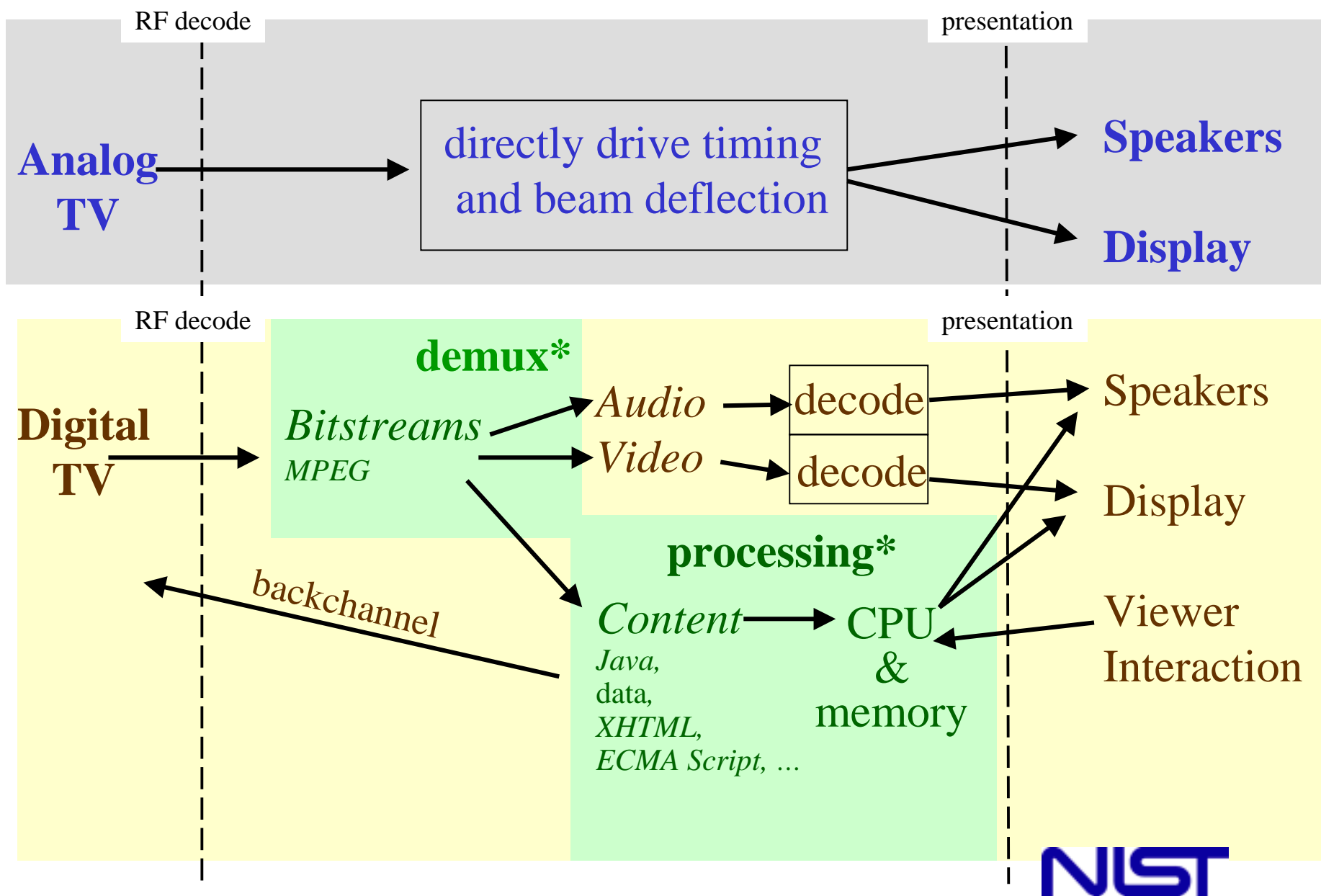
# Interactive Digital Television

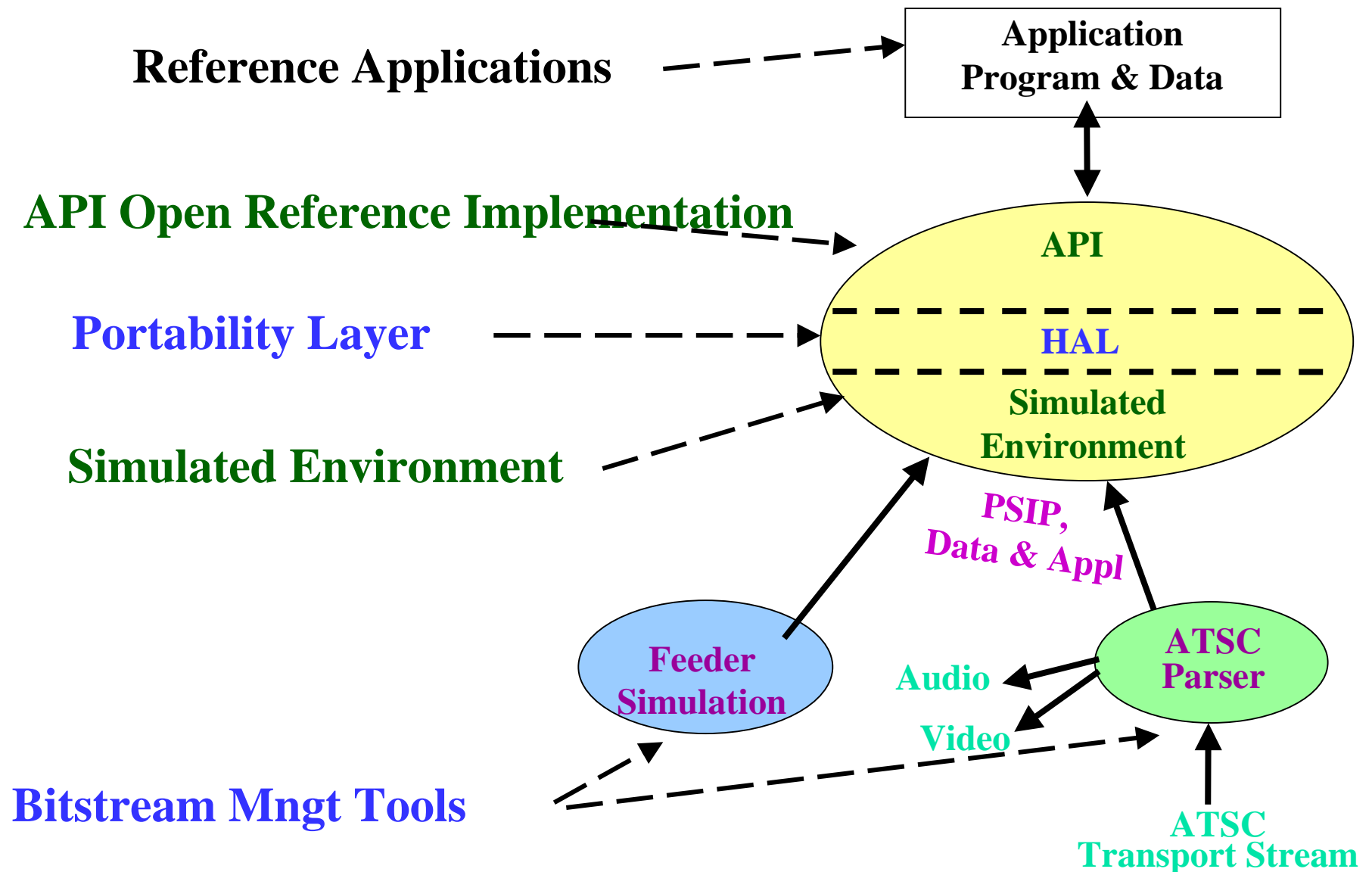
- Migration of passive to interactive viewing
- Custom “push” services offered during programming
- Transactions from the couch
- Revolution: Multitasking



Who moved my TV?

# Analog and Digital TV





# DASE API Reference Platform





# Electronic Books

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- Multifunctions in one reading platform
- Open standards initiated by NIST in '98
- Future books will converge audio and video
- Revolution: Recombinant media formats

**Who moved my MP3?**

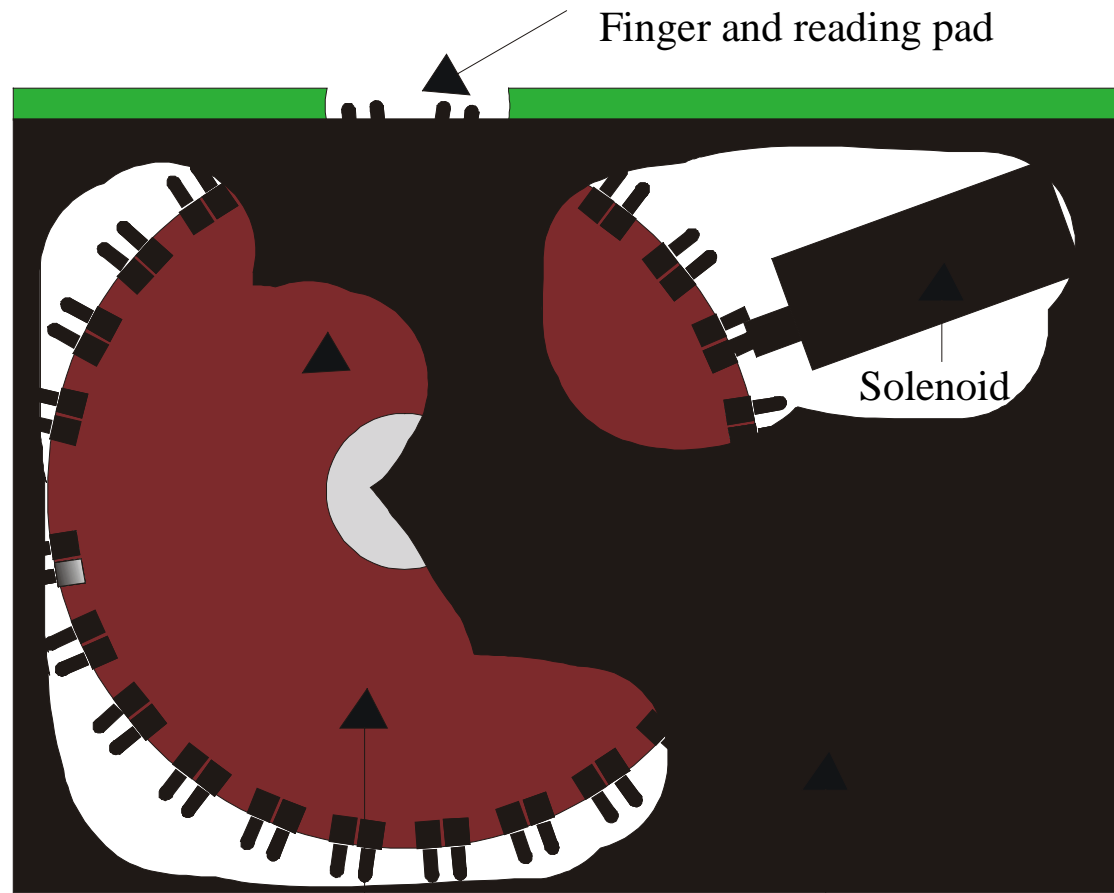
# Electronic Books: Braille Reader



- Braille readers technology opens a door to digital world (computer, Internet...) for Braille users
- This is our original concept and design that places Braille text on a rotating wheel with low cost and high performance (patent pending)
- Favorable reviews by the National Federation for the Blind and media (e.g. N.Y. Times 12/29/00)
- Future approach: low-cost tactile graphic array

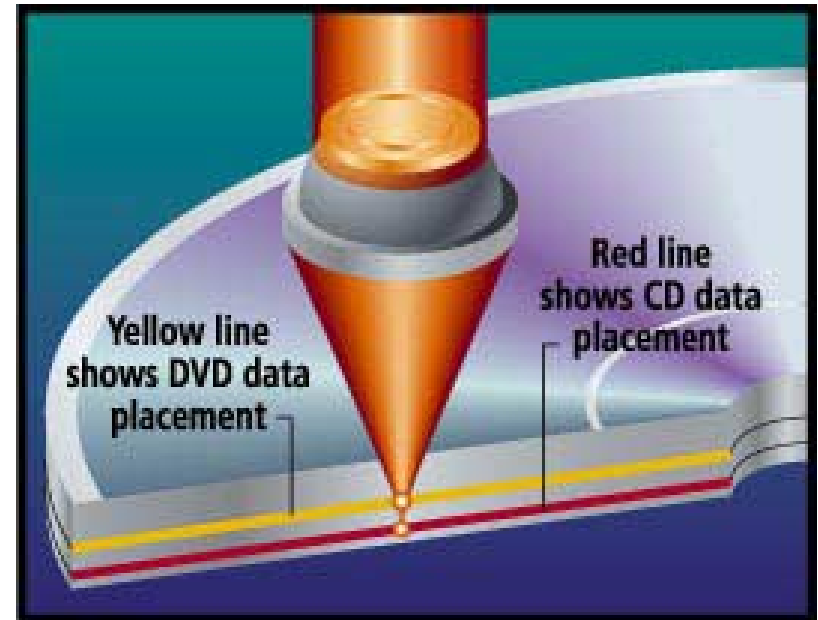
# E-Books for the Visually Impaired

## *Low –Cost Braille Reader*



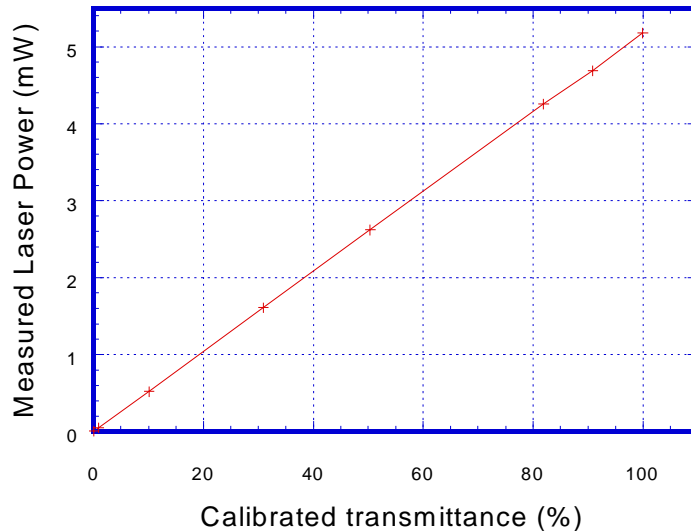
# Optical Disc Storage

- DVD and similar platforms offer packaged bandwidth
- Standards/interoperability needed for writable DVD
- 250 MB/yr for every person on the planet; apps need much more!!
- Revolution: Fluorescent Multilayer Disc



Who moved my LPs?

# Advanced Optical Data Storage



- The Optical Disc Manufacturing Association (ODMA) entrusts WAMO (subsidiary of Time Warner) to make calibration discs for DVD.
- Reflectance is one of the most important parameters in DVD technology, especially for dual layer discs.
- NIST developed a new method to measure disc reflectance with very high accuracy (1%).
- WAMO will use the accurately measured disc by NIST as a standard to calibrate their calibration discs, which will be distributed to all DVD manufacturers for quality control.

# Advanced Optical Data Storage



- MultiRead specification (on paper) generated by Optical Storage Technology Association (OSTA), that ensures compatibility of all CD media with CD and DVD devices
- NIST MultiRead test program creates a clear mechanism for the user to identify CD and DVD drives that can read Audio CD, CD-ROM, CD-Recordable (CD-R) and CD-ReWritable (CD-RW) discs
- NIST test program for MultiRead will be released to public (6/01)



# CD/DVD/PD READ COMPATIBILITY

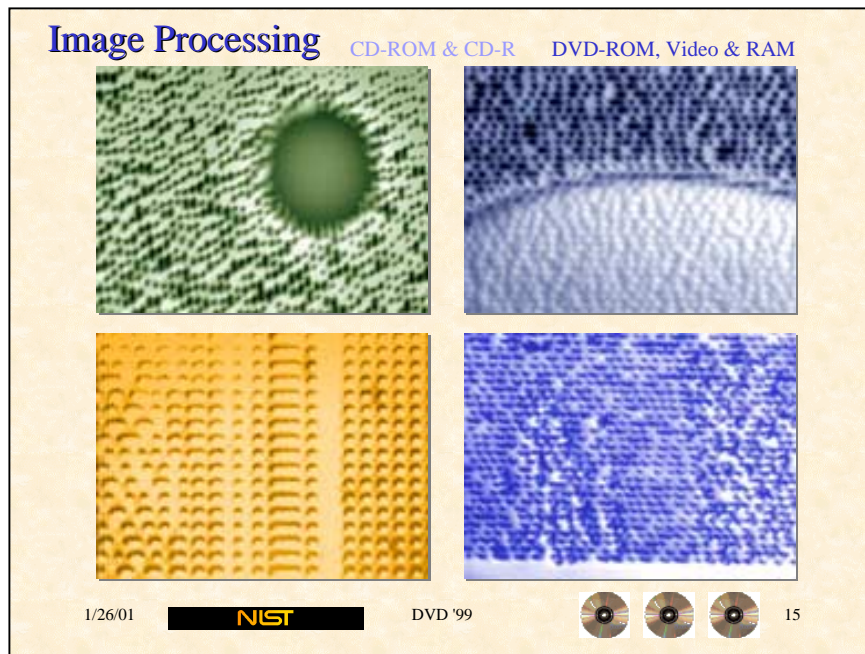
Media	Driver								
	CD-ROM	CD-R	CD-RW	DVD-ROM	DVD-R	DVD-RAM	DVD+RW	DVD-RW	PD
CD-ROM	√	√	√	√	√*	√	√	R	√
CD-R	√	√	√	√*	√*	√*	√	R	√
CD-RW	√*	√*	√	√*	√*	√*	√	R	R
DVD-ROM			R	√	√	√	√	√	
DVD-R				R	√	R	R	R	
DVD-RAM				R	R	√	R	R	
DVD+RW				R	R	R	√	R	
DVD-RW				R	R	R	R	√	
PD						O			√

√ = YES      R = RECOMMENDED      O = OPTIONAL  
 \* ACHIEVED BY DRIVES WITH "MULTIREAD" CAPABILITY

**NIST**



# Advanced Optical Data Storage



- NIST disc testbed for Physical parameter characterization of optical discs
- Parameters including defect observation, pit size analysis, tilt measurement for CD-ROM, CD-R and CD-RW discs
- Accelerated aging treatment for DVD-R discs is in processing





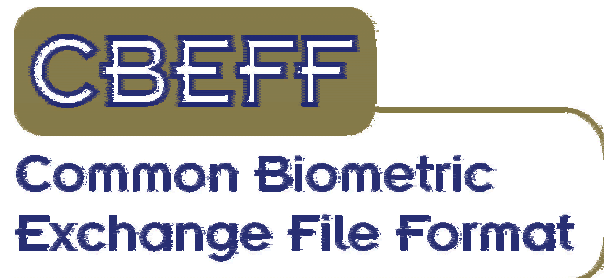
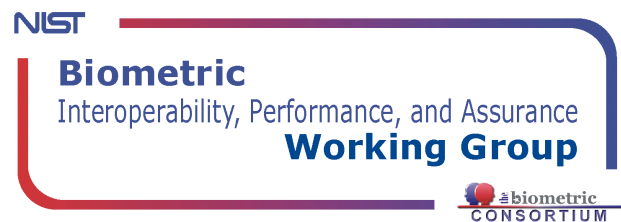
# Biometrics & Smart Cards

- No more passwords or pins
- Open standards: BioAPI, CBEFF
- Biometrics integrated in your smart card
- Revolution: Content linked to your biometric



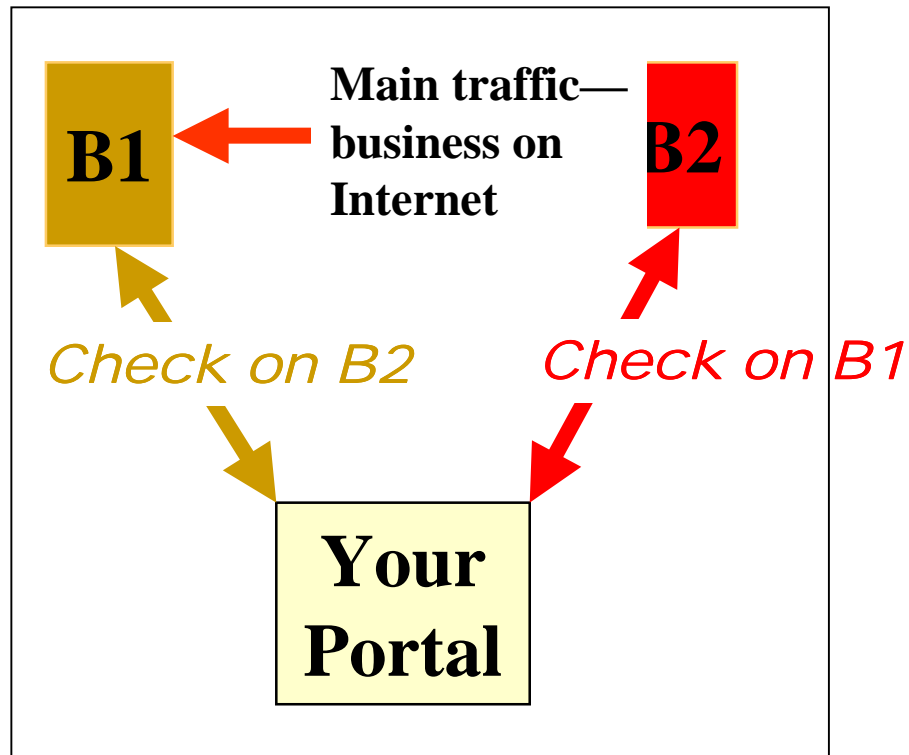
**Who moved my password key?**

# Biometrics and Smart Cards



- R&D:  
With industry participation, NIST spearheaded the development of the Common Biometric Exchange File Format (CBEFF);
  - > BioAPI interoperability test bed;
  - > Challenge-response techniques;
  - > Authentication architecture development
  - > biometric data transformations
- NIST William Slichter Award winner (11/00)

# Trust Management



- Security-no, risk management approaches
- No open standards
- Digital rights management is the big heavy
- Revolution: copying is your friend, and encourage your friends to copy

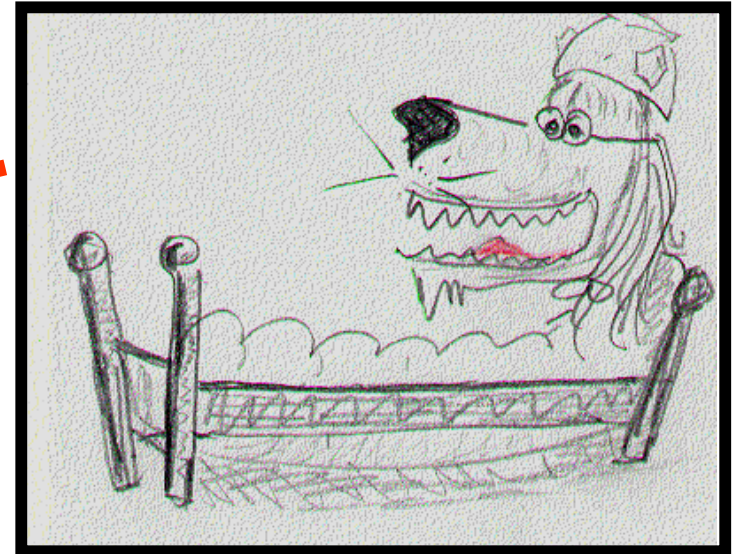
**Who moved my B2B?**

# Problem: Trust Whom?

*(not same as security)*



Internet

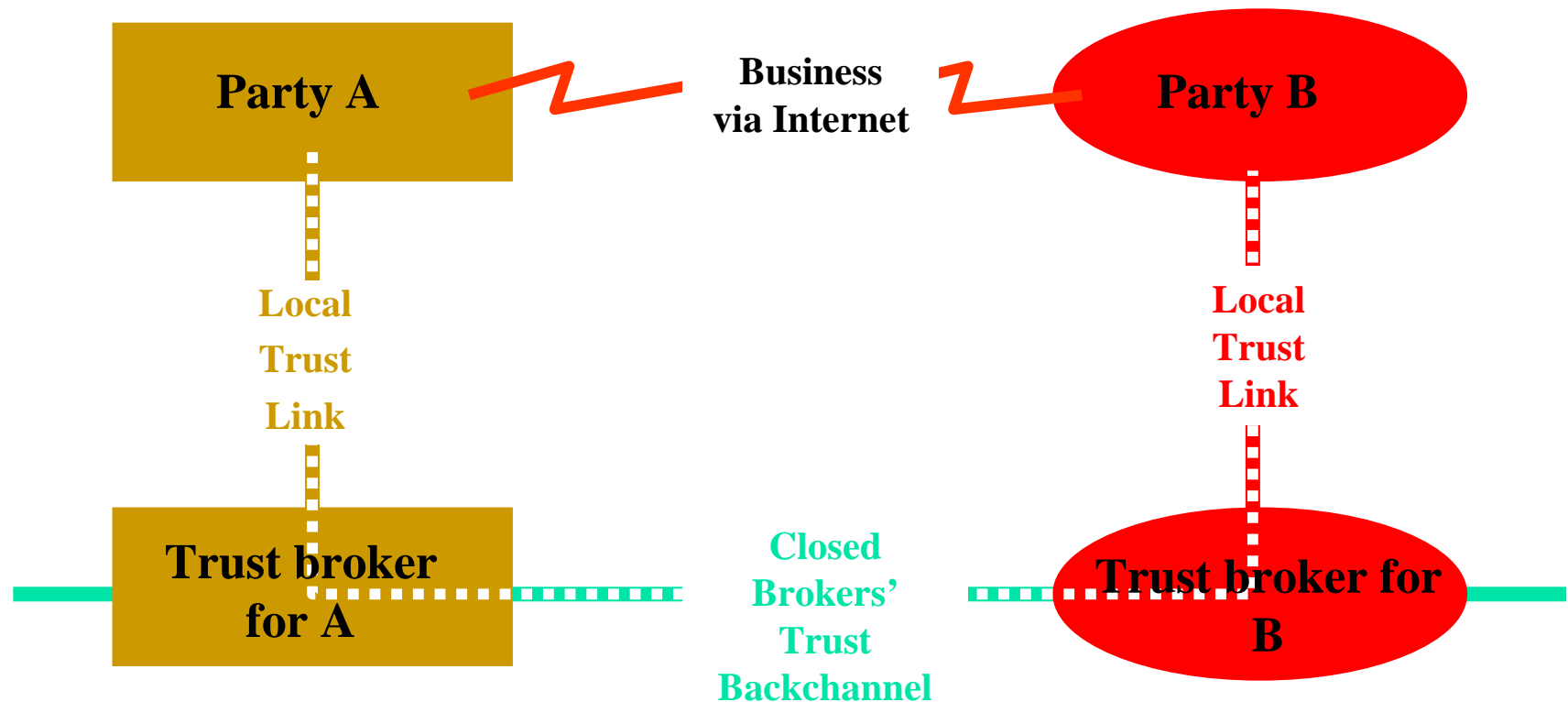


# FAST\* Framework for Interoperable Trust in E-Business

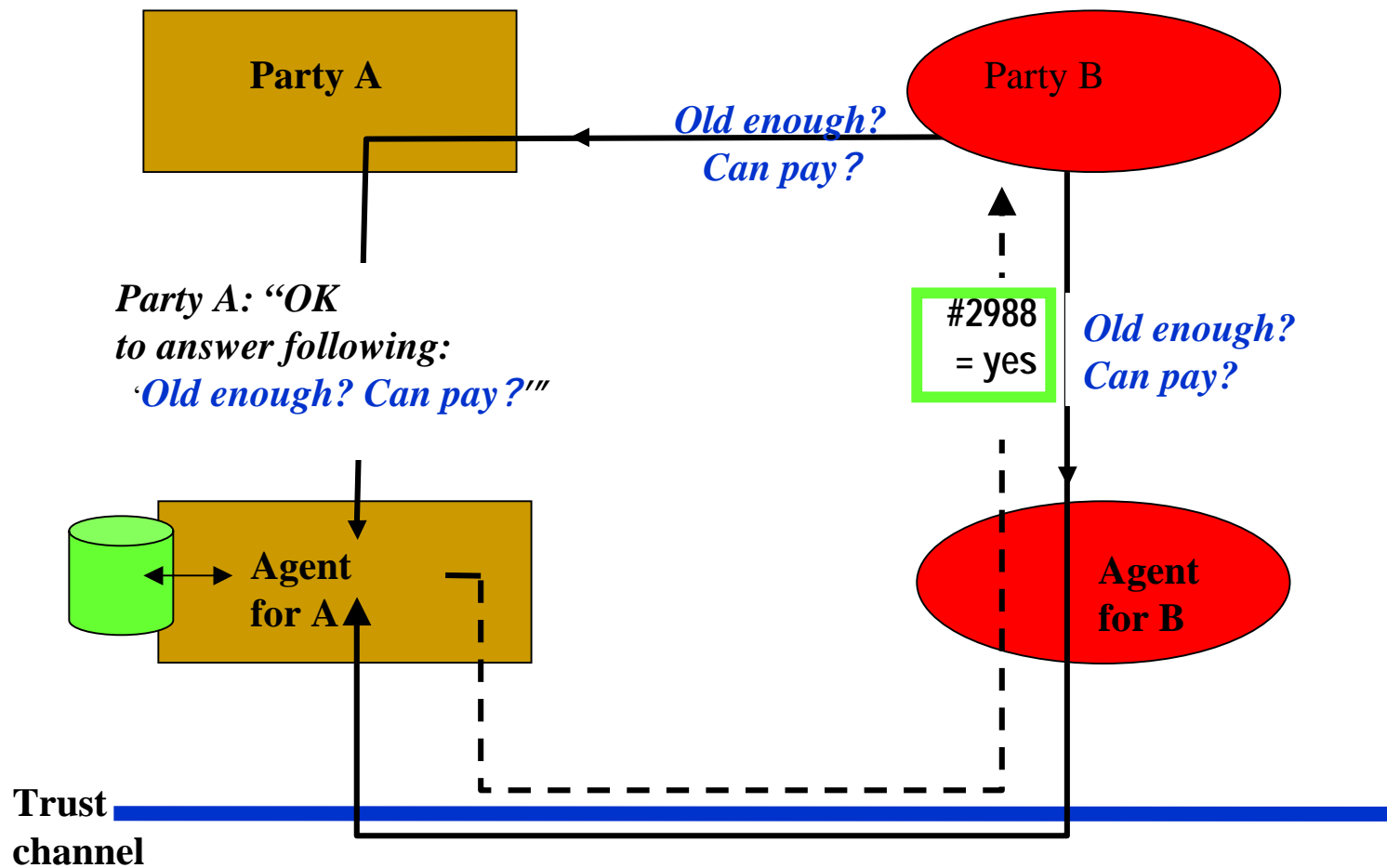
*\* Financial Agent Secure Transaction*

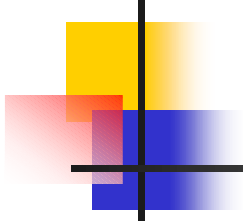
*Is this the true site for B?  
How reliable has B been?*

*Is A old enough to order?  
Does A have funds to pay?*



# Handling a Query (good privacy)





# Digital Cinema

- Quality and color fidelity 1<sup>st</sup> and nth time of showing
- No standards yet
- Distribution is digital & multipath
- Revolution: viewer completely immersed –including a taste for popcorn!!



**Who moved my DMD?**



# Who has my cheese?

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- New division in NIST's Information Technology Laboratory
- Mission: R&D into the exchange, storage, and manifestation of digital content







# Convergent Information Systems: 301-975-XXXX

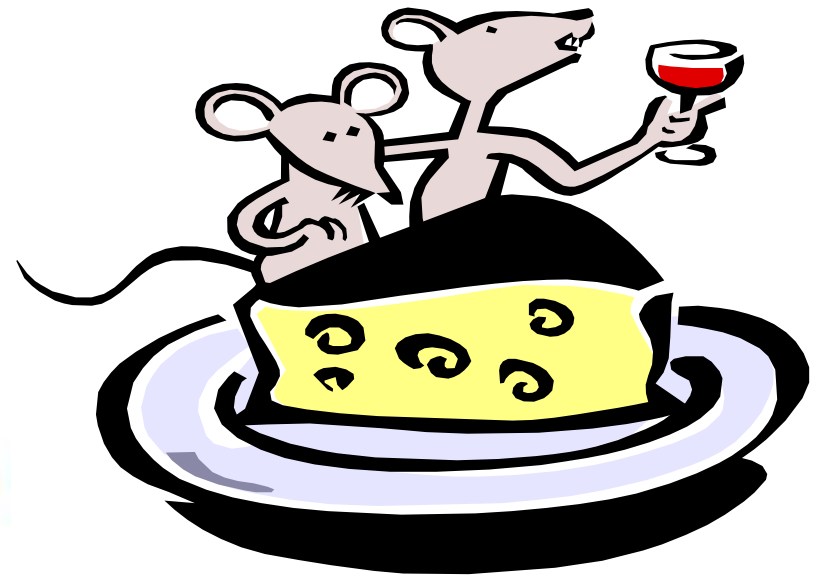
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- Ebooks
- Braille Reader
- I-DTV
- Biometrics
- Optical Disc Storage
- Digital Cinema
- Trust Management
- Frederick Byers x2909
- John Roberts x5683
- Alan Mink x5681
- Fernando Podio x2947
- Xiao Tang x2503
- Charles Fenimore x2428
- Gordon Lyon x5679

Or by e-mail at [john.doe@nist.gov](mailto:john.doe@nist.gov)



# Where is my N-I-S-T?



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**NIST**